JMicron Technology Corporation

Product Brief

JMS581D
USB 3.2 Gen2x1 to SATA 6Gb/s & PCIe G3x2 Bridge Controller

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Revision History

Revision number	Effective date	Description of revision		Author
		Reference	Description of change	
1.00	20/01/2020	--	Initial release	Larry Chien

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1 Overview

JMS581D is a system on chip solution which embedded with USB 3.2 Gen2x1 10Gb/s, SATA 6Gb/s and PCIe/ NVMe Gen 3x2. Its upstream port provides a USB which data speed can reach up to 10Gb/s. Meanwhile, its downstream port can connect to SATA/ PCIe/ NVMe storage devices, such as a hard drive, solid-state drive, CFast/CF Express memory card. The data speed for SATA port can reach 6Gb/ s, or the data rate for the SATA III requirement. The PCIe port can reach 16Gb/s, or the data rate for the PCIe Gen3x2 requirements.

Moreover, JMS581D has USB Type-C™ connectivity built in to the controller that any device using JMS581D can have a USB Type-C™ connector without adding any additional peripheral part. It can save costs to buy parts, and efforts to build inventory, and it can reduce printed circuit board area for the system designs.

JMS581D supports TRIM to the NAND flash based storages and enable transmit and receive data by both of the USB Mass Storage Class Bulk-Only Transport (BOT) and USB Attached SCSI Protocol (UASP) to and from the host respectively. The data storage devices can achieve its summit of performance by taking advantage of these built-in unmatched features.

JMS581D is well equipped for power management that it can meet a wide variety of power requirements from different scales of data storage systems: external storage enclosure (M.2 combo enclosure), adapter and portable storage applications.

Owing to its USB Type-C™ connectivity, JMS581D can work with some power management controllers to a USB Power Delivery (PD) enabled data storage device. The data storage devices having SSDs of large capacity can accept the electrical power from sources of energy, such as hosts acting as a power provider of USB PD to supply sufficient electricity to the device after they negotiate with each other, without plugging in.

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2 Features

2.1 General Features

- Design for Windows 7, Windows 10 and MAC 10.10.5 or later version
- Provide 8 hardware controlled PWMs
- Provide software utilities for downloading the upgraded firmware code under USB2.0/ USB3.2 Gen1 and USB3.2 Gen2
- 144TFBGA (9x9mm^2) package
- Support 25MHz external crystal
- Support 3.3V I/O
- 32 GPIOs for customization

2.2 Universal Serial Bus

- Comply with USB 3.2 Gen 1 and Gen 2 Specification,
- Comply with USB Mass Storage Class, Bulk-Only Transport Specification (Revision 1.0)
- Comply with USB Attached SCSI Protocol (UASP) Specification (Revision 4)
- Integrate with USB Type-C™ multiplexer & configuration channel (CC) logic
- Support USB Super-Speed/ High-Speed/ Full-Speed Operation
- Support USB2.0/ USB 3.2 Gen 1/ Gen 2 power saving mode
- Support external SPI NVRAM for Vendor VID/PID of USB2.0/USB 3.2 Gen 1/2 device controller

2.3 PCI Express

- Comply with PCI Express Base Specification Revision 3.1a
- Comply with NVM Express 1.3
- Support TRIM to the SSD

2.4 Serial ATA

- Comply with SATA Specification (Revision 3.1)

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3 Block Diagram

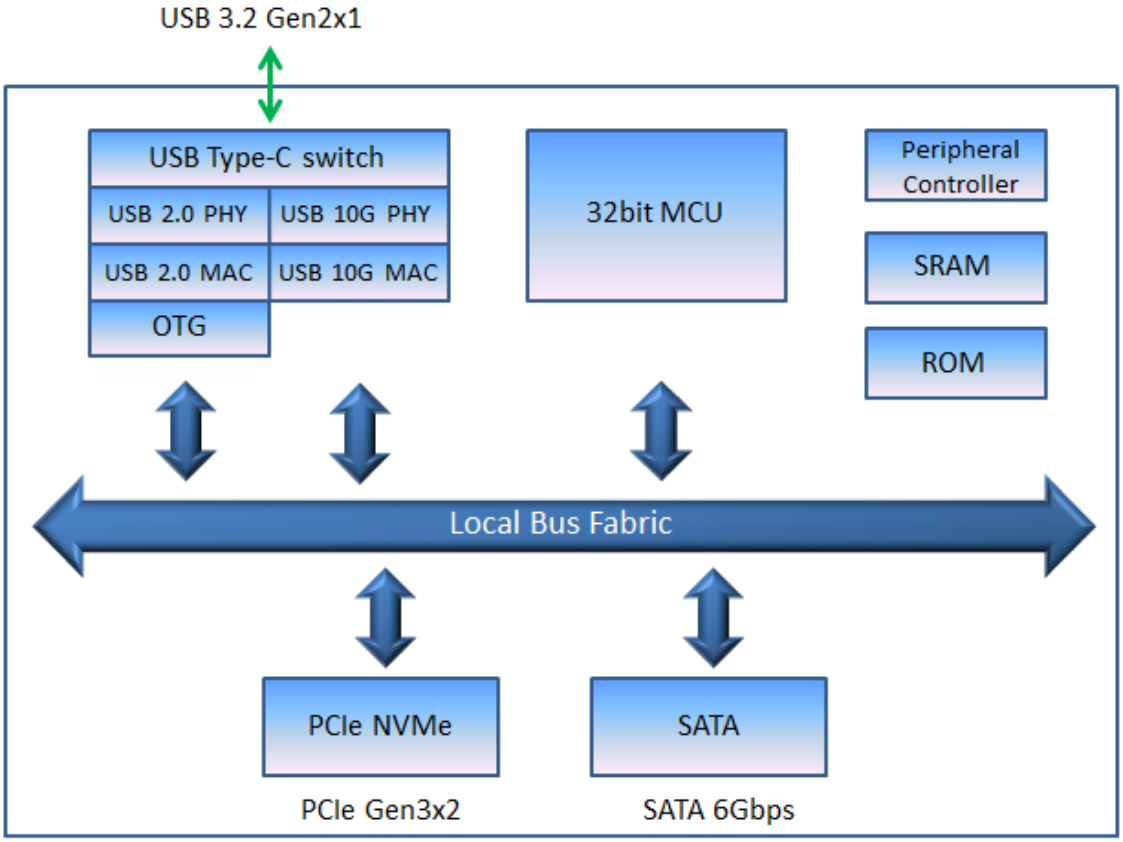

Figure 1 Block Diagram – JMS581D

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4 Application

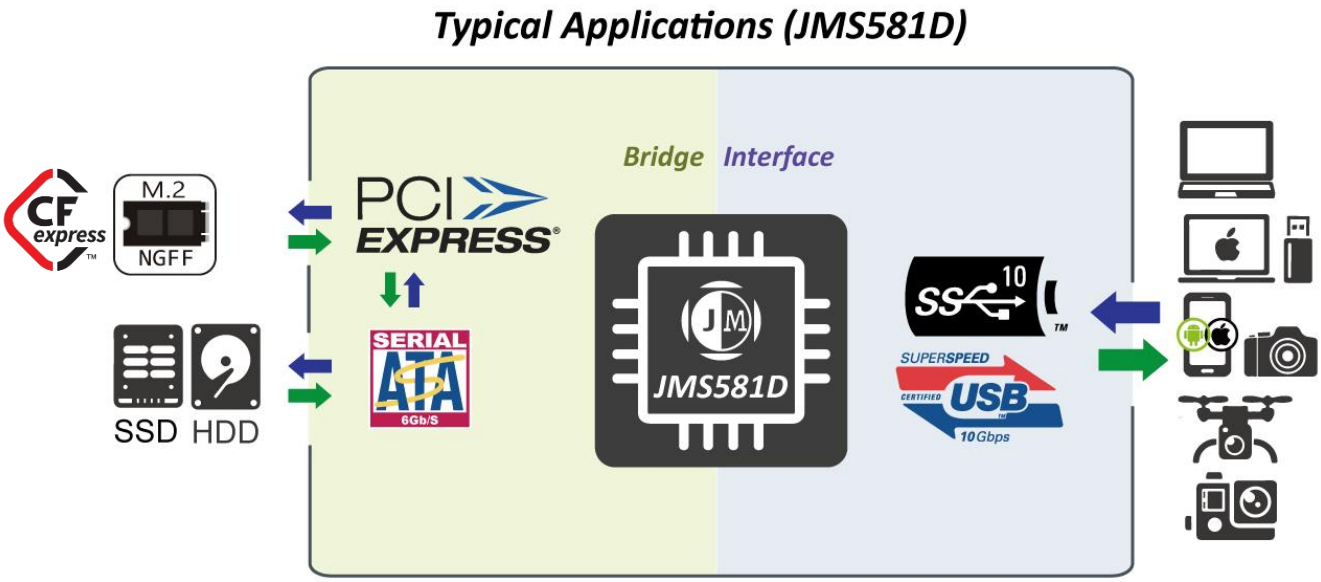

Figure 2 Application Scenarios

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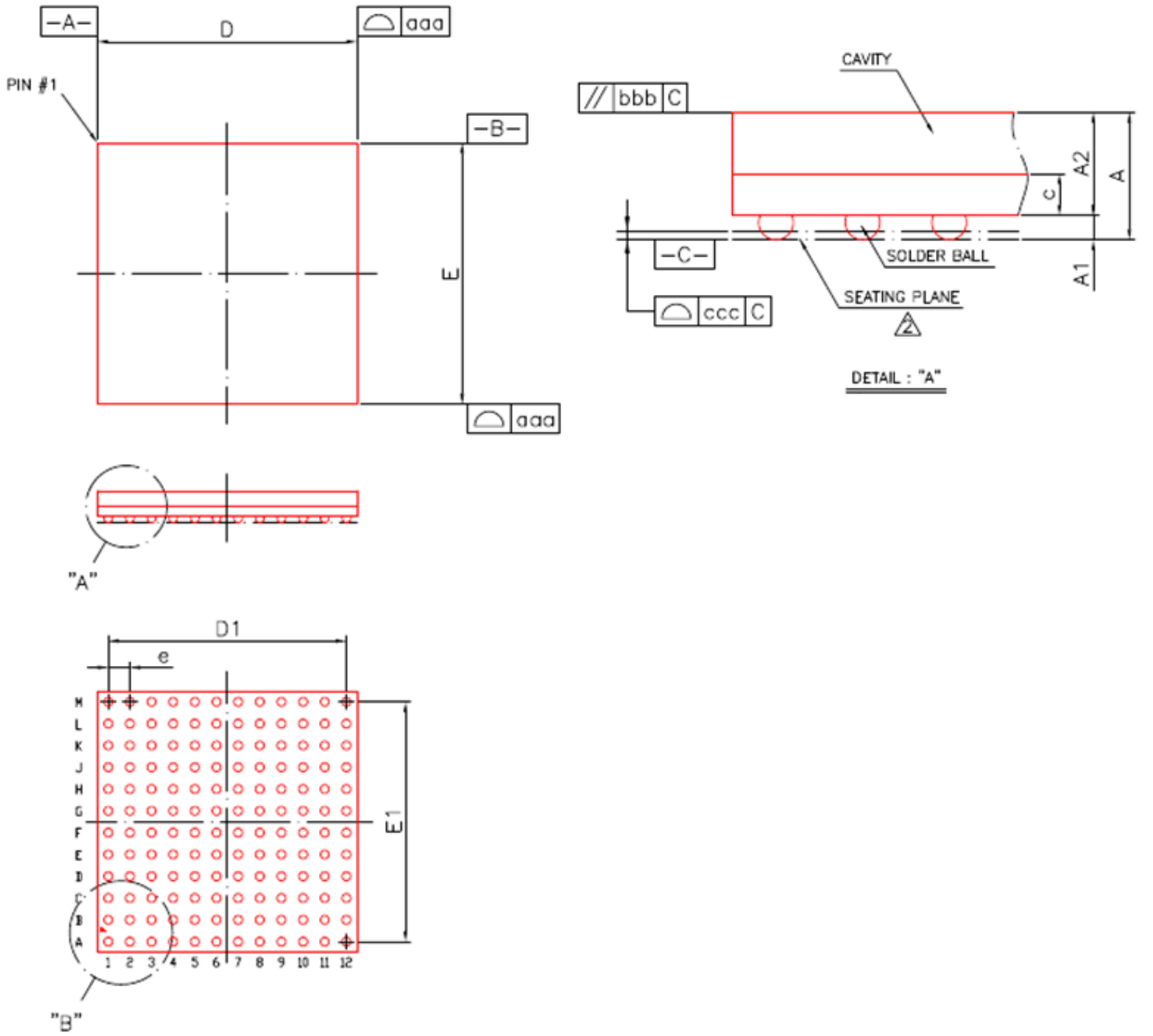
5 Package Dimension



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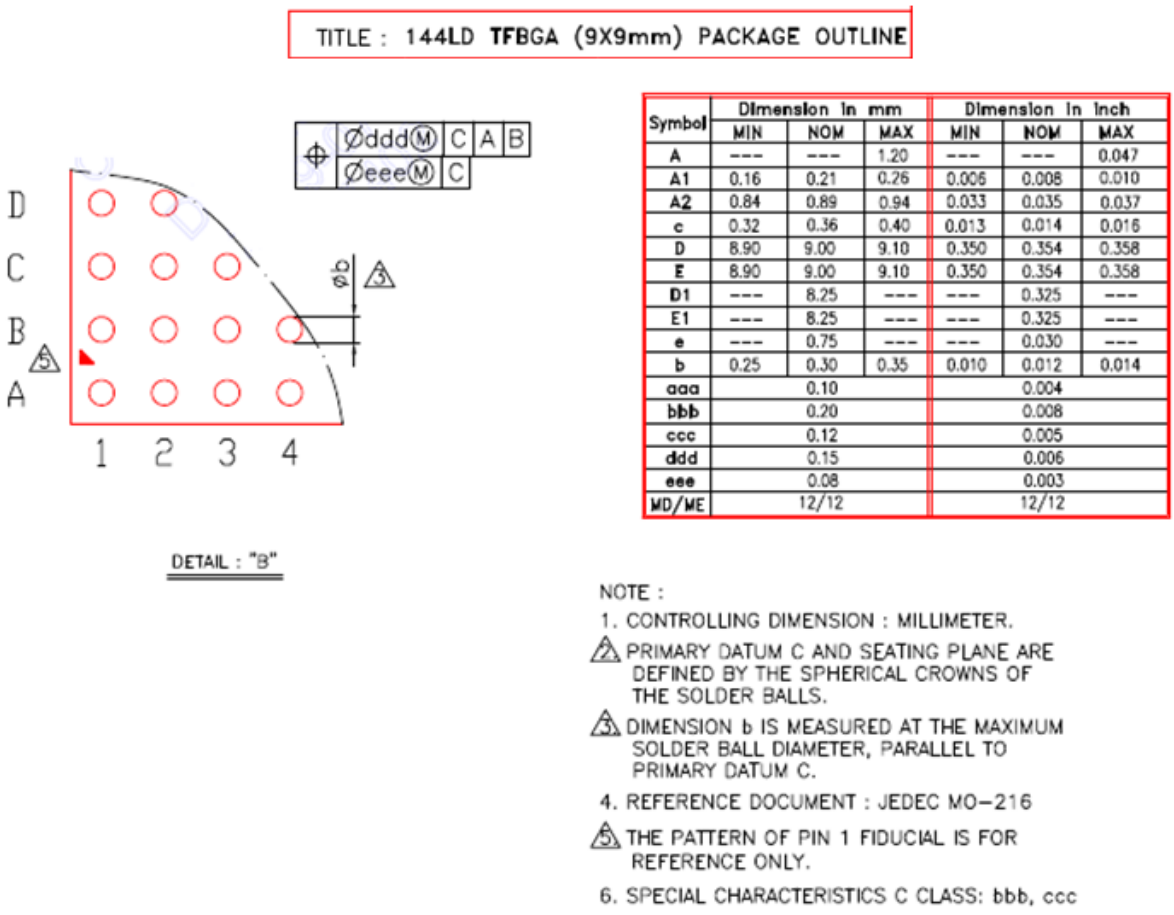

Symbol	Dimension in mm			Dimension in inch		
	MIN	NOM	MAX	MIN	NOM	MAX
A	---	---	1.20	---	---	0.047
A1	0.16	0.21	0.26	0.006	0.008	0.010
A2	0.84	0.89	0.94	0.033	0.035	0.037
c	0.32	0.36	0.40	0.013	0.014	0.016
D	8.90	9.00	9.10	0.350	0.354	0.358
E	8.90	9.00	9.10	0.350	0.354	0.358
D1	---	8.25	---	---	0.325	---
E1	---	8.25	---	---	0.325	---
e	---	0.75	---	---	0.030	---
b	0.25	0.30	0.35	0.010	0.012	0.014
aaa	0.10			0.004		
bbb	0.20			0.008		
ccc	0.12			0.005		
ddd	0.15			0.006		
eee	0.08			0.003		
MD/ME	12/12			12/12		

Figure 3 Package Outline Drawing of 144TFBGA 9x9mm²

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